Field Installation and Service Guide

For Authorized Installers Only

ACV Assure™

AA-MFP-ACV

This Field Installation and Service Guide is intended to be a tool for Authorized Installers to use in the installation and commissioning of the ACV Assure™ system. As part of the installation and commissioning processing, Authorized Installers are expected to be familiar with all components of the ACV Assure system and complete the necessary pre-work to achieve a successful installation. This includes:

- Completing the ACV Assure Qualification Check List and ACV Assure Site Survey;
- Performing pre-installation mechanical fabrication and wiring;
- Familiarizing themselves with various other installation requirements, including on-site construction and hardware mounting, sensor and plumbing fitting, ACV Assure electric wiring, ACV Assure retrofits with a solenoid valve;
- Commissioning the hardware and Syncta® dashboard for the ACV Assure

⚠ WARNING

THINK SAFETY FIRST

Read this Guide BEFORE using this equipment.

Failure to read and follow all safety and use information can result in death, serious personal injury, property damage, or damage to the equipment.

Keep this Guide for future reference.

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NOTICE

Use of the ACV Assure™ Monitoring System Manual does not replace the need to comply with all required instructions, codes, and regulations related to the installation, operation, and maintenance of an Automatic Control Valve (ACV), including the standard observance and monitoring of water conditions.

Watts is not responsible for the failure of alerts due to connectivity or power issues.

WATTS®

Important Safety Information

⚠ WARNING

To avoid death, serious personal injury, property damage, or damage to the equipment:

- **Learn how to properly and safely use the equipment BEFORE installing, setting up, using, or servicing.**
- **Keep the guide available for easy access and future reference.**
- **Replace missing, damaged, or illegible guides and product labels.**
- **Read the guide and all product labels and follow all safety and other information.**

Understanding Safety Information

This safety alert symbol is shown alone or used with a signal word (DANGER, WARNING, or CAUTION). A pictorial and/or safety message to identify hazards and alert you to the potential for death or serious personal injury.

⚠ DANGER Identifies hazards which, if not avoided, will result in death or serious injury.

⚠ WARNING Identifies hazards which, if not avoided, could result in death or serious injury.

⚠ CAUTION Identifies hazards which, if not avoided, could result in minor or moderate injury.

NOTICE Identifies practices, actions, or failure to act which could result in property damage or damage to the equipment.

This pictorial alerts you to the need to read the manual.

This pictorial alerts you to electricity, electrocution, and shock hazards.

List of Parts

The kits consist of the following components:

- Cellular Gateway
- Control Box
- Flow Switch (Kits 10101000 and 10101001)
- Pressure Sensor (kits 10101000 and 10101002)
- Hardware (feet, cable gland, tamperproof hardware and torx bits)

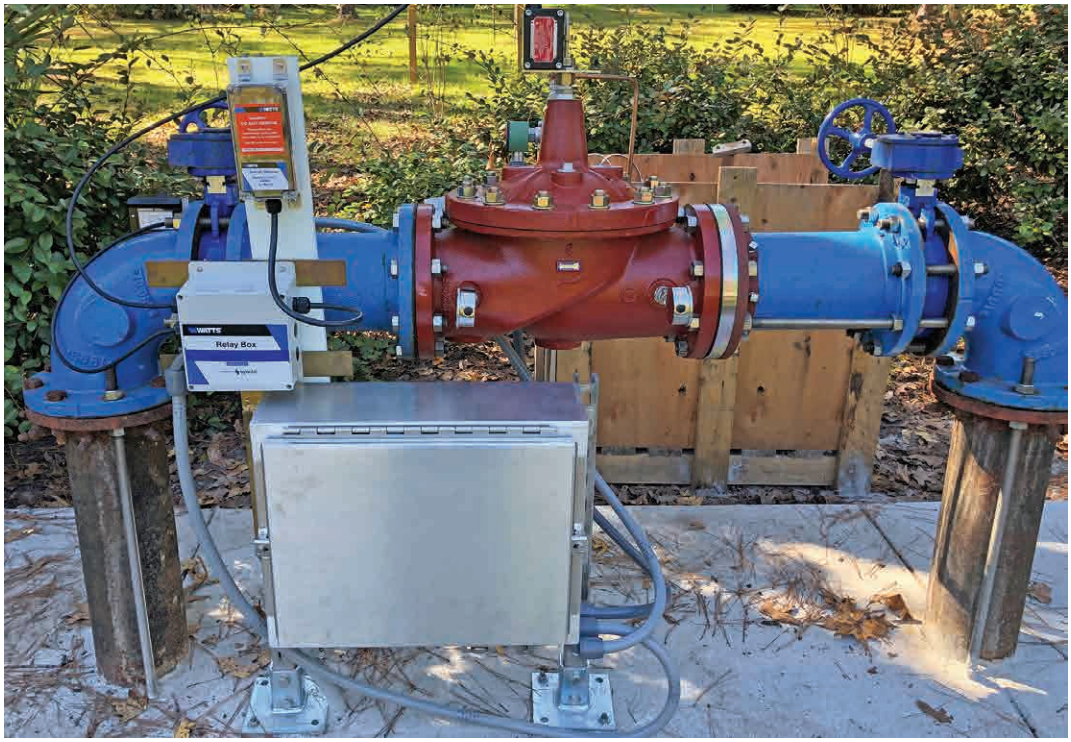
Example of an ACV Assure hardware kit packaging.

NOTICE

ENVIRONMENTAL CONDITIONS

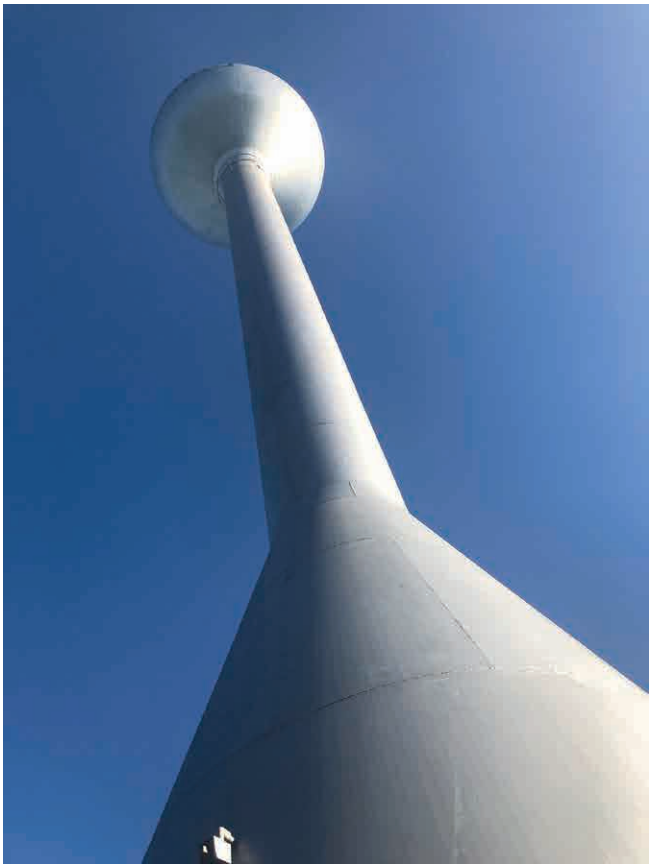
During ACV Assure installation, system and components must be installed in accordance with the manufacturer specifications including the temperature specifications. If the environmental conditions are outside of the ranges outlined on the ACV Assure Engineering Specification sheet, an appropriate environmental enclosure shall be used.

Applications (Typical)



Solenoid Control Pressure Reducing ACV

ACV Assure hardware installation on a 165 ft. water tower base



165 ft. Water Storage Tower

Applications (Typical)

Pressure transducer installed in ground storage tank

Remote installation with solar panel for power

Vault with solar panel

Inside vault

Battery box with Cellular Gateway

Control Box and Cellular Gateway Installation

Prior to on-site installation, fill out and save the ACV Assure Qualification Check List and ACV Assure Site Survey in the Syncta Dashboard's Geo Location Detail Page.

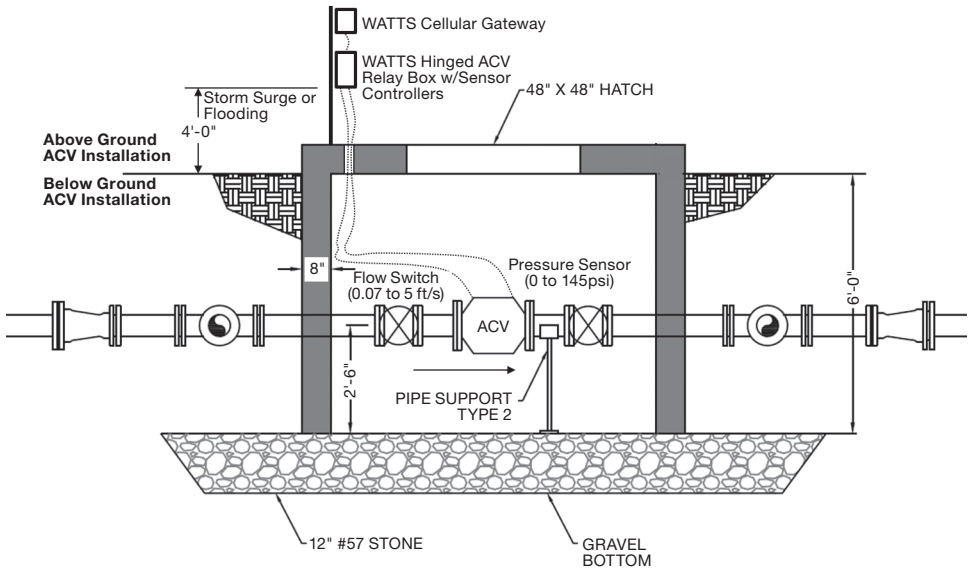
Control Box with Field Wired Pressure Controller

- Mount in a good cellular signal area.
- Mount to a rigid structure.
- The Control Box should be installed vertical and upright as shown at the field installation.
- The Control Box should be mounted 4 feet above the grade at the field installation
- The Control Box should be prewired at the service provider's shop and tested.
- For pressure sensor installations, the pressure controller is placed in the Control Box as shown in the above picture.
- Use the packaging foam to secure the Controller on both sides against the Control Box. (not shown)
- Use the mounting feet which are included in the shipping box.

Field Wired Cellular Gateway

- Mount in a good Cellular signal area.
- Mount to a rigid structure.
- The Cellular Gateway should be installed vertical and upright as shown at the field installation.
- The Cellular Gateway should be mounted above the Control Box.
- The Cellular Gateway should be prewired at the service provider's shop and tested.
- Use the mounting feet which are included in the shipping box.

Installation Example



Component Installation Details

Cellular Gateway Wiring

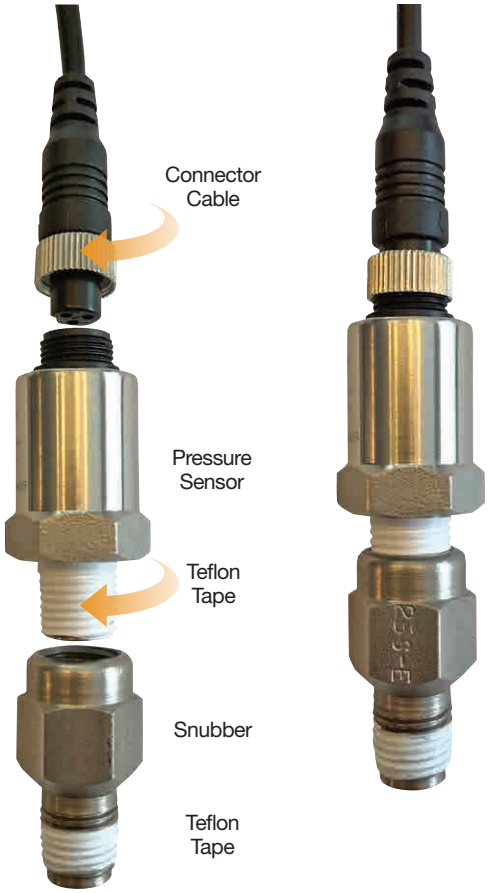
Follow Wire Color to Input Terminals

Control Cable, 6 conductors, 22 AWG, PVC conductor insulation material for the Cellular Gateway

Flow Switch Wiring

Control Cable, use 4 of the 6 conductors, 22 AWG, PVC conductor insulation material for the Flow Switch

Snubber Installation for the Pressure Sensor



Pressure Sensor installation must include the supplied snubber.

1. Mount the snubber at the ¼" NPT sensing location port.
2. Wrap Teflon®* tape on the pressure transducer pipe threads
3. Install the pressure sensor into the snubber using a wrench on the pressure sensor hex.
4. Install the supplied connector cable.

*Teflon® is a registered trademark of The Chemours Company.

Watertight Splice for the Pressure Transducer (When Control Cable Length Exceeds 9ft.)

Crimp butt connector PVC red 22-18ga

Tubing length is 1" to 1½" from dimension X

⅜ ID adhesive lined heat shrink tubing - 3 to 1 ratio

Place tubing over cable first before crimping

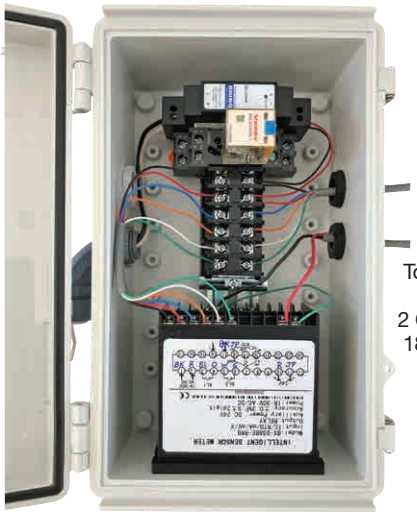
Use butane torch or heat gun to shrink tubing

Common Application Wiring Diagrams

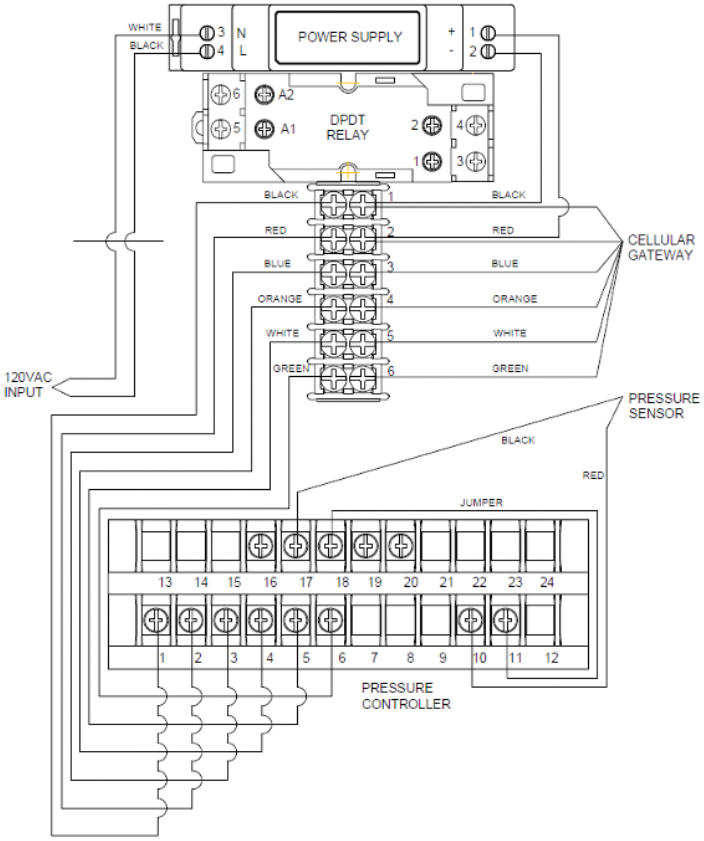
Relay Box Wiring for Pressure Sensing

Control Cable, 6 conductors, 22 AWG, PVC conductor insulation material for the Cellular Gateway, Flow Switch, Pressure Controller & 24VDC Power Supply

120 VAC
2 Conductor,
18-20 AWG



To Pressure
Sensor
2 Conductor,
18-20 AWG

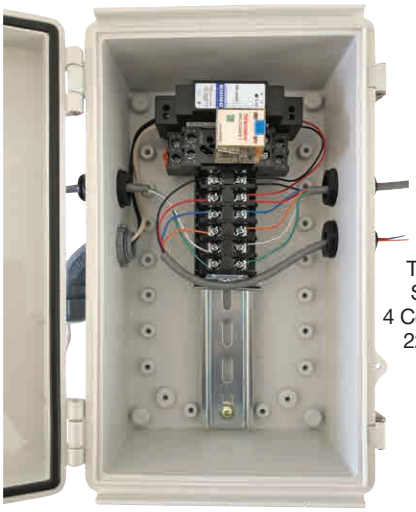


Relay Box for Monitoring Flow

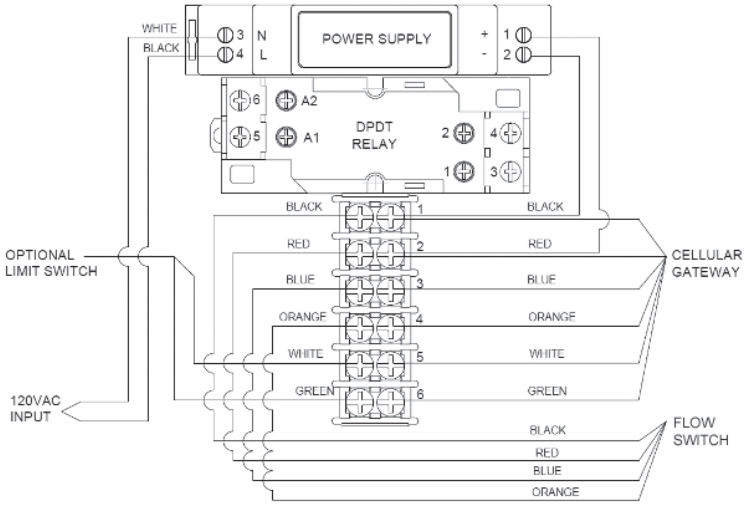
Control Cable, 6 conductors, 22 AWG, PVC conductor insulation material for the Cellular Gateway, Flow Switch, Pressure Controller & 24VDC Power Supply

Limit Switch
2 Conductor,
20-22 AWG

120 VAC
2 Conductor,
18-20 AWG



To Flow
Switch
4 Conductor,
22 AWG



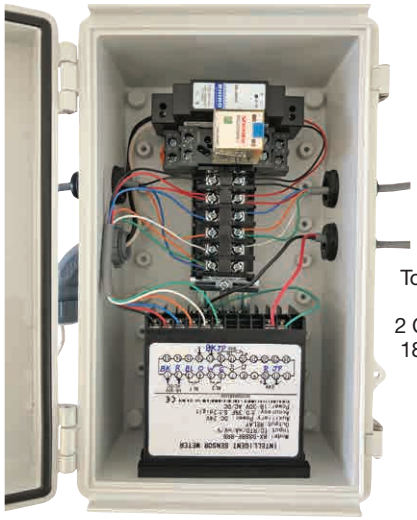
Common Application Wiring Diagrams

Relay Box Wiring for Water Loss Sensing

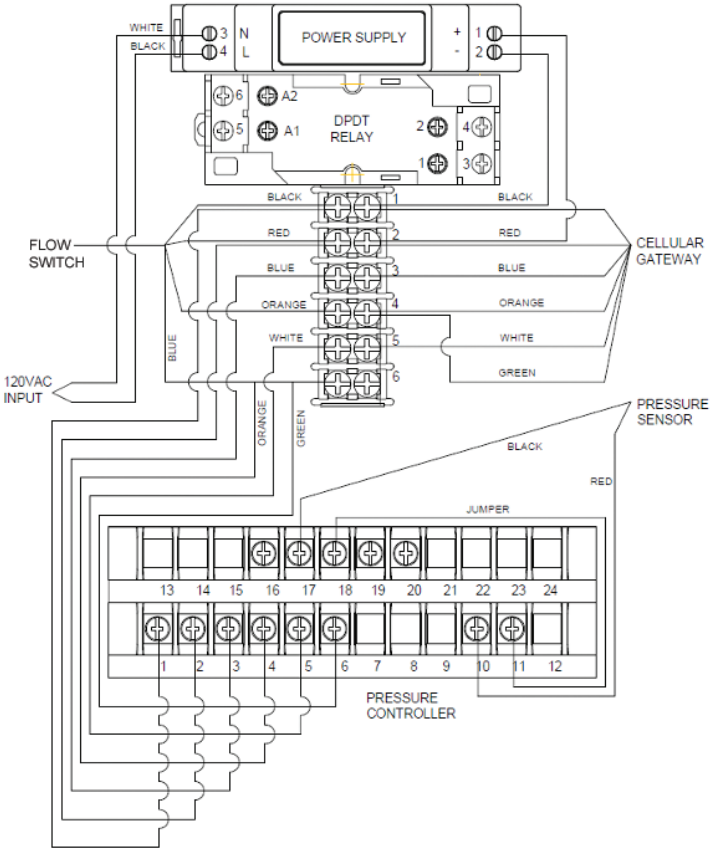
Control Cable, 6 conductors, 22 AWG, PVC conductor insulation material for the Cellular Gateway, Flow Switch, Pressure Controller & 24VDC Power Supply

To Solenoid
2 Conductor,
18-20 AWG

120 VAC
2 Conductor,
18-20 AWG



To Pressure
Sensor
2 Conductor,
18-20 AWG



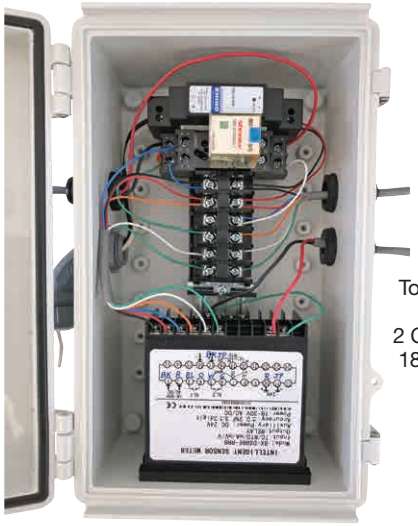
Common Application Wiring Diagrams

Relay Box Wiring for ACV Zone Control

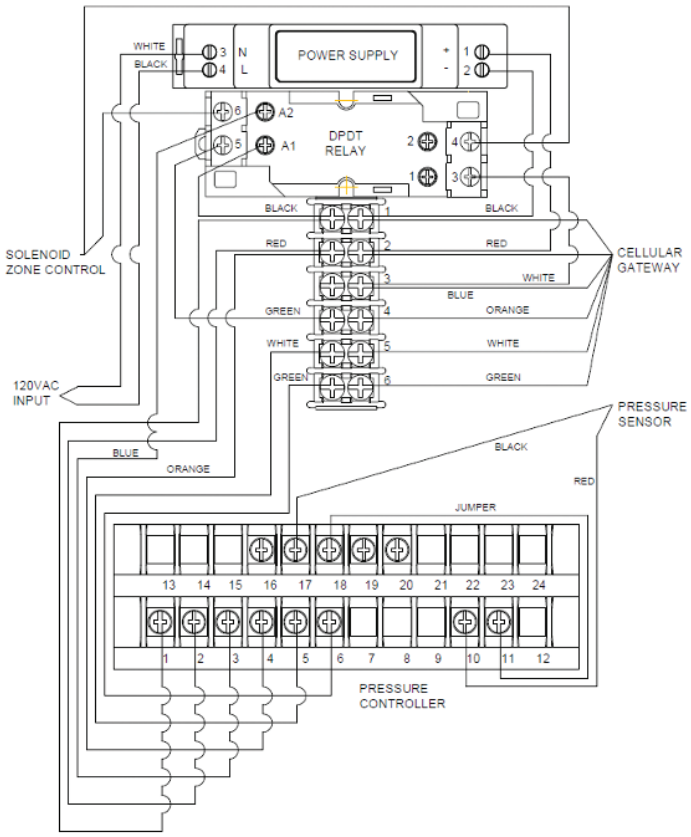
Control Cable, 6 conductors, 22 AWG, PVC conductor insulation material for the Cellular Gateway, Flow Switch, Pressure Controller & 24VDC Power Supply

To Solenoid
2 Conductor,
18-20 AWG

120 VAC
2 Conductor,
18-20 AWG

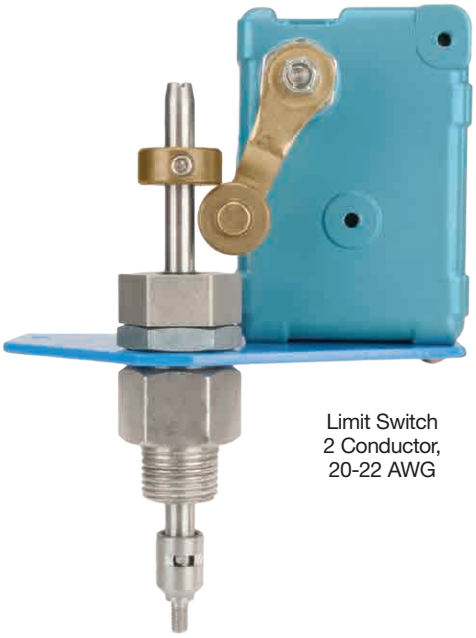


To Pressure
Sensor
2 Conductor,
18-20 AWG

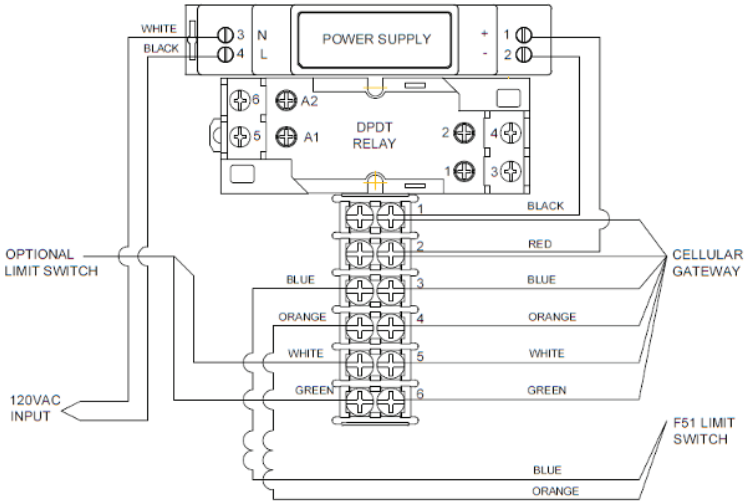


Relay Box Wiring for ACV Open or Close Position

Control Cable, 6 conductors, 22 AWG, PVC conductor insulation material for the Cellular Gateway, Flow Switch, Pressure Controller & 24VDC Power Supply



Limit Switch
2 Conductor,
20-22 AWG



Installation and Set-Up

Installing the Cellular Gateway

⚠ WARNING

Ensure all power supply to the Cellular Gateway is turned off before making any connections to the Cellular Gateway. Failure to do so may result in electrocution, personal injury, and/or death.

When identifying a location to mount the Cellular Gateway, the device must be placed away from large metal objects and structures that can block cellular signal. Additionally, the cellular antenna is located on the upper right inner side wall of the enclosure. When mounting, ensure that this part of the device is away from any walls, wires, pipes, or other obstructions, especially anything metallic.

1. Before mounting, apply power to the Cellular Gateway to ensure there is adequate cell coverage. On startup, the CELL LED will blink at a rate of 1sec. This indicates it is searching for a cell connection. Once connected it turns steady blue. If connection is poor, it will blink with short OFF pulse every second. If there is a poor or no connection, find a new location. **Once cell coverage is established, disconnect power from the Cellular Gateway before proceeding.**
2. Mount the Cellular Gateway at the selected location, using the mounting tabs and screws provided with the kit. Screws to attach the unit to the wall are not included.
3. Using the four-conductor cable supplied with the kit, connect the Control Box to the Cellular Gateway. Route wires from the WIRELESS terminals of the Control Box through the Cellular Gateway's wiring gland and connect to the matching terminals.

   PWR to PWR

   GND to GND

   Input 1: Blue/Orange Wire

   Input 2: White/Green Wire

   Six feet of cable is supplied with the unit, but the Cellular Gateway can be located up to 100 feet away from the Control Box. If additional wire is used it must meet the required rating for the Control Box (300V, 22 AWG).
4. To prevent water or dust from entering the Cellular Gateway, Control Box & Relay Box, tighten all wiring glands.
5. Apply power to the Control Box and Cellular Gateway.

Cellular Gateway

Setting Up the Cellular Gateway

1. **Startup** – Upon startup, the POWER LED will light up a steady green to indicate power is supplied. The Cellular Gateway will automatically go into its startup sequence. During the startup sequence, the CELL and IoT LED will blink blue, indicating the Cellular Gateway is searching for a cellular connection. This may take up to 10 minutes. Once the cellular and cloud connections are established, the CELL LED and IoT LED will be steady blue.
2. **Cellular Connection** – After the startup sequence is completed, the CELL LED will be a steady blue if there is a good connection. It will blink with short OFF pulses if there is a poor connection.
3. **IoT Connection** – If there is a cloud connection, the IoT LED will be a steady blue. IoT LED will blink if cloud connection is lost or not established. It will continue trying to connect indefinitely.

NOTICE

If there is no cloud connection, users will not receive notifications via Syncta.

4. **Test Button** – When cellular and Cloud connections have been made, you can send a test message through the Syncta app by pressing the TEST button.
5. **Reset Button** – You can reset the Cellular Gateway and restart the startup sequence by pressing the RESET button. This will cause all on-going operations to cease.

Installation and Set-Up

Startup Sequence

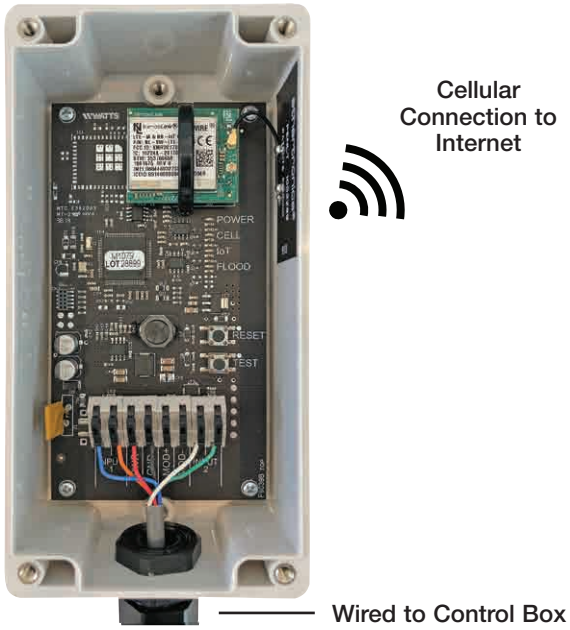
When the Cellular Gateway powers up, the device goes through a startup sequence. Below is the startup sequence that the device will go through if everything is working correctly.

COLOR	STATE	DEFINITION
	Steady Green	Green LED turns on - when power is applied
	Cell LED blinks	Trying to establish a cellular connection.
	IoT LED blinks	Trying to establish a connection to the Watts Cloud.

Operation

This section provides information about the different LED lights, buttons, and connectors inside the SentryPlus Alert™ Cellular Gateway, as well as troubleshooting suggestions if needed.

Cellular Gateway



LEDs

The LEDs inside the Cellular Gateway indicate if a component/ connection is running, or if there is an issue. The following sections describe the different LED colors and blink patterns.

Power

The POWER LED turns on when power is supplied to the device.

COLOR	STATE	DEFINITION	SOLUTION
	Steady Green	The device is turned on.	N/A
	Off	If the device is plugged in, but this LED is not on, the device is not receiving power.	Check wiring to Control Box.

Cellular

The CELLULAR LED indicates whether or not a cellular connection is present.

COLOR	STATE	DEFINITION	SOLUTION
	Steady Blue	A cellular connection is present.	N/A
	Short off blink	The cellular connection is poor.	See Poor or No Cellular Reception on pages 11.
	Blue blinking	There is no cellular connection — searching.	See Poor or No Cellular Reception on pages 11.

IoT

The IoT LED indicates whether or not there is a connection to the cloud.

COLOR	STATE	DEFINITION	SOLUTION
	Steady Blue	There is a connection to the Watts Cloud.	N/A
	Blinking	There is **not** a connection to the Watts Cloud. Trying to establish connection.	See No Connection to the cloud on page 12.

Buttons

The only buttons that you might need to use are the RESET and TEST buttons. See the section below for more information. Both can be used by user.

RESET

Press this to reset the Cellular Gateway and restart the device. This will cause all ongoing operations to cease.

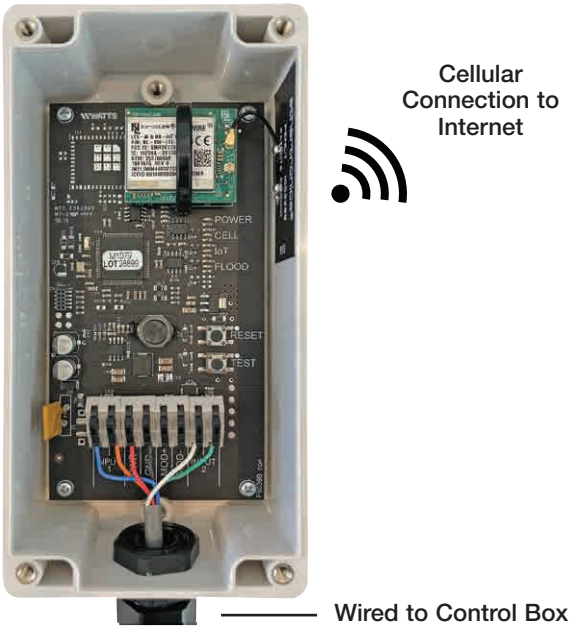
Note: You can also perform a full reset by removing power to the Cellular Gateway for 10 seconds and then plugging it back in.

TEST

Press to have a test notification sent.

Note: The unit must have already been registered and communication preferences must be set in order for these notifications to be sent.

Cellular Gateway



Troubleshooting Guide

This section provides troubleshooting solutions to the most common issues if your Cellular Gateway is not working correctly. If you are unable to resolve your issue, contact your local Watts representative to order a replacement device.

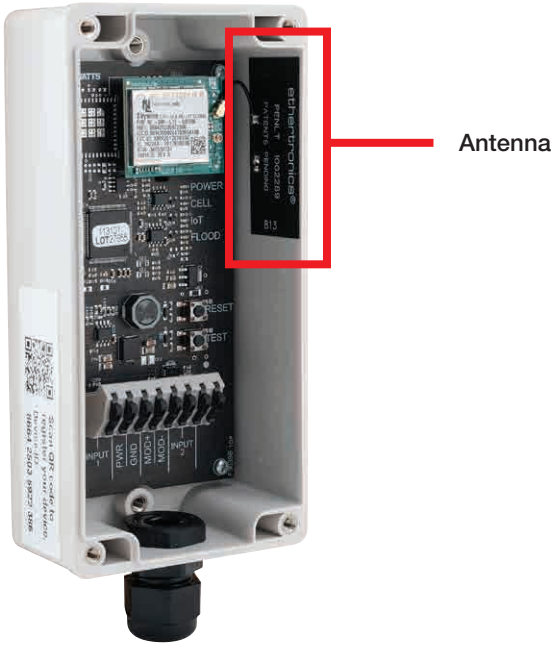
Poor or No Cellular Reception

Poor or no cellular reception will cause notifications to not work. As noted in the Installation, Operation and Maintenance Manual, the installation location is important for cellular reception. If the CELLULAR LED is blinking due to poor or no connection, the most likely issue is poor reception. If the device is still not working, review the possible causes and solutions below.

Possible Cause 1

The location where the antenna is installed may be interfering with cellular reception.

Note: Care should be taken to ensure that the antenna side of the device is installed away from any walls, wires, pipes, or other obstructions, particularly anything metallic.



Solution 1

Move the Cellular Gateway to a location where the antenna is not facing any internal walls, wires, pipes, or other obstructions, such as an electrical box.

Possible Cause 2

The location has poor cellular reception.

Solution 2

Move your Cellular Gateway to a different location and check to see that the CELLULAR LED is steady blue; if it is not, move the device until you find a location with better cellular reception.

Note: You can install the Cellular Gateway up to 100 feet away from the Junction Box. Six feet of wire is supplied with the Cellular Gateway. If additional wire is used, it must meet the required rating for the Junction Box (300V, 22 AWG).

Please consider the following before installing the Cellular Gateway outdoors:

- If the unit is installed outdoors, additional precautions may need to be taken to ensure the wire entry at the bottom of the node is adequately sealed (with silicone or something similar) to prevent water intrusion.

Possible Cause 3

Cellular reception might not be supported at your site.

The Cellular Gateway operates using AT&T LTE Cat-M1. **Mobile phone reception is not a reliable indicator of expected signal strength for the Cellular Gateway.**

Solution 3

If you cannot find cellular reception anywhere at your site, you may not have carrier coverage at your site. Contact Syncta's Customer Support team at 888-725-4285 for more information.

POWER LED is Off

If the POWER LED is off, make sure the Cellular Gateway is plugged in and that the power outlet is active, wired to Control Box correctly, and Control Box is powered with the provided 24Vdc power supply. If the device is still not working, review the possible cause and solution below.

Possible Cause

If the Cellular Gateway is plugged in and the POWER LED is off, the +24Vdc & GND wiring polarity inside the Cellular Gateway might have been accidentally swapped.

Solution

Use the instructions below to swap the +24Vdc and GND wiring inside the Cellular Gateway.

1. Remove power from the Control Box.
2. Swap places of the wires in the power terminals of the Cellular Gateway.
3. Reapply power to the Control Box
4. If the POWER LED is still off, contact Syncta's Customer Support team (support@syncta.com or 888-725-4285).

No Connection to the Cloud

If the IoT LED is blinking, there is no connection to the Watts Cloud. If the device is not working, review the possible cause and solution below.

Possible Cause

There is a disruption in service between the Watts Cloud and the Cellular Gateway.

Solution

Contact the Syncta customer support team (support@syncta.com or 888-725-4285) to confirm whether the issue is specific to your Cellular Gateway or to the cellular service provider.

Installing Covers on Cellular Gateway and Control Box

Cellular Gateway

As received with
(4) captured
M4 screws

After wiring, remove
(2) diagonal captured
M4 x 16mm screws

Assemble the cover and use
(2) supplied tamper resistant
M4 x 16mm screws

Control Box

After commissioning latch the Control Box cover closed and
use the supplied tamper-resistant screw and nut M4 x 16mm to
secure the Control Box closed

Registering ACV Assure and Other Assets

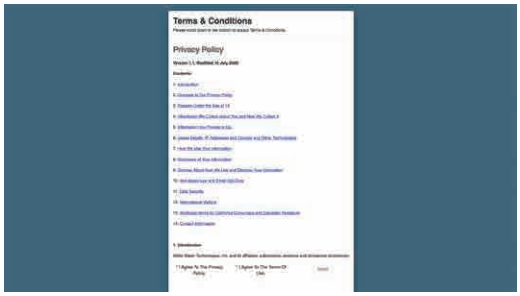
Register the Syncta device
https://app.syncta.com/en/connected/onboarding/welcome

Log in to the Syncta account
https://app.syncta.com/users/sign_in
already logged into your account go to https://app.syncta.com/en/connected/dashboard

Step 1.

Step 2.

Step 3.

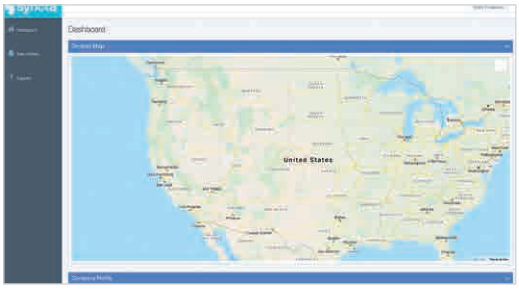


Step 4.

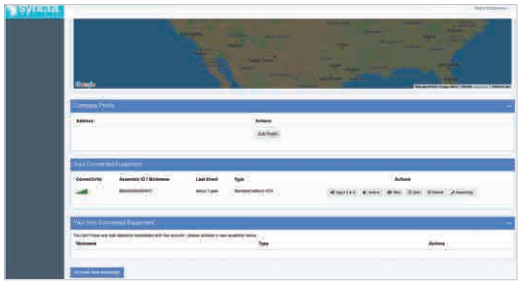
Step 5.

Step 6.

Step 7.



Step 8.



Notes

Limited Warranty: Watts (the "Company") warrants each product to be free from defects in material and workmanship under normal usage for a period of one year from the date of original shipment. In the event of such defects within the warranty period, the Company will, at its option, replace or recondition the product without charge.

THE WARRANTY SET FORTH HEREIN IS GIVEN EXPRESSLY AND IS THE ONLY WARRANTY GIVEN BY THE COMPANY WITH RESPECT TO THE PRODUCT. THE COMPANY MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED. THE COMPANY HEREBY SPECIFICALLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The remedy described in the first paragraph of this warranty shall constitute the sole and exclusive remedy for breach of warranty, and the Company shall not be responsible for any incidental, special or consequential damages, including without limitation, lost profits or the cost of repairing or replacing other property which is damaged if this product does not work properly, other costs resulting from labor charges, delays, vandalism, negligence, fouling caused by foreign material, damage from adverse water conditions, chemical, or any other circumstances over which the Company has no control. This warranty shall be invalidated by any abuse, misuse, misapplication, improper installation or improper maintenance or alteration of the product.

Some States do not allow limitations on how long an implied warranty lasts, and some States do not allow the exclusion or limitation of incidental or consequential damages. Therefore the above limitations may not apply to you. This Limited Warranty gives you specific legal rights, and you may have other rights that vary from State to State. You should consult applicable state laws to determine your rights. **SO FAR AS IS CONSISTENT WITH APPLICABLE STATE LAW, ANY IMPLIED WARRANTIES THAT MAY NOT BE DISCLAIMED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF ORIGINAL SHIPMENT.**

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